WHAT IS CLAIMED IS:

1. An optical fiber preform manufacturing apparatus for shrinking and closing a deposited tube, comprising:

a lathe for supporting a deposited tube vertically, the deposited tube having a clad layer and a core layer and the deposited tube being sealed at one end and unsealed at the other end thereof;

a circular heater arranged around the deposited tube while being circumferentially spaced apart from the deposited tube by a desired distance, said circular heater for supplying heat to the deposited tube supported by the lathe and being movable upwardly and downwardly at a desired speed;

a vacuum pump connected to the unsealed end of the deposited tube for pumping air existing in the interior of the deposited tube using a vacuum; and

a process control unit for setting a heating temperature of the circular heater to a desired temperature, and conducting a control operation for processes of shrinking and closing the deposited tube while upwardly and downwardly moving the circular heater.

2. The optical fiber preform manufacturing apparatus according to claim 1, wherein the lathe comprises:

an upper support member for supporting the sealed end of the deposited tube; and

a lower support member for supporting the other end of the deposited tube, the lower

support member cooperating with the upper support member to rotate the deposited tube at a desired speed during the tube shrinking and closing processes.

3. The optical fiber preform manufacturing apparatus according to claim 1, further comprising:

a chlorine gas injector for supplying chlorine gas to the interior of the deposited tube to remove moisture generated in the interior of the deposited tube due to heat from the circular heater.

4. The optical fiber preform manufacturing apparatus according to claim 1, wherein the circular heater comprises a furnace.

5. The optical fiber preform manufacturing apparatus according to claim 1, wherein the circular heater comprises a burner.

6. The optical fiber preform manufacturing apparatus according to claim 4, further comprising an inert gas injector for supplying inert gas to the furnace to prevent an oxidation of the furnace at a heat generating region.

7. The optical fiber preform manufacturing apparatus according to claim 1, wherein the process control unit comprises means for conducting sequential control operations for setting the

heating temperature of the circular heater to a temperature lower than a softening point of the deposited tube, exhausting contaminants existing in the interior of the deposited tube while moving the circular heater at a desired temperature, setting the heating temperature of the circular heater to a temperature not lower than the softening point of the deposited tube, and shrinking and closing the deposited tube while moving the circular heater to a desired temperature.

8. The optical fiber preform manufacturing apparatus according to claim 1, wherein the process control unit comprises means for conducting a control operation for rotating the deposited tube supported by the lathe at a desired speed during the shrinking and closing processes.

9. An optical fiber preform manufacturing method, comprising the steps of:

depositing a clad layer and a core layer on an inner surface of a preform tube, thereby forming a deposited tube;

shrinking one end of the deposited tube, thereby sealing the one end of the deposited tube;

arranging the deposited tube in such a fashion that it extends vertically through a circular heater;

moving the circular heater to the sealed end of the deposited tube, and then adjusting a heating temperature of the circular heater to be not lower than a softening point of the deposited tube; and

heating the deposited tube while moving the circular heater at a desired speed, thereby

shrinking and closing the deposited tube.

10. The optical fiber preform manufacturing method according to claim 9, further comprising the steps of:

moving the circular heater to the sealed end of the deposited tube, and then adjusting the heating temperature of the circular heater to be lower than a softening point of the deposited tube; and

heating the deposited tube while moving the circular heater at a desired speed, thereby exhausting contaminants existing in the interior of the deposited tube.

11. The optical fiber preform manufacturing method according to claim 9, wherein the shrinking and closing step is carried out under the condition in which the deposited tube rotates at a desired speed, and the interior of the deposited tube is maintained at a negative pressure.

12. The optical fiber preform manufacturing method according to claim 9, wherein the circular heater is a furnace, and inert gas is supplied to the furnace to prevent an oxidation of the furnace at a heat generating region.

13. The optical fiber preform manufacturing method according to claim 9, wherein the shrinking and closing step is carried out under the condition in which chlorine gas is supplied to the

interior of the deposited tube, thereby removing moisture generated in the interior of the deposited tube due to heat of the circular heater.

14. An apparatus for manufacturing an optical fiber preform, comprising:

a deposited tube, said deposited tube comprising:

a glass tube;

a deposited layer formed on the inner surface of the glass tube by a modified chemical vapor deposition method; and

a seal formed on one end of the deposited tube;

a vertical lathe for supporting and rotating the deposited tube around a vertical axis, said vertical lathe comprising:

an upper support member for supporting the upper end of the deposited tube;

a rod connected to the sealed end of the deposited tube and supported by said upper support member; and

a length-adjusting member for adaptably supporting the lower end of the deposited tube;

a circular heater mounted on the vertical lathe, said heater surrounding a portion of the deposited tube and being moveable vertically along the length of the deposited tube;

a chlorine gas injector connected to the lower support member, for supplying chlorine gas to the inside of the deposited tube through the lower support member; and

a vacuum pump connected to the lower support member, for removing gas from the deposited tube.

15. The apparatus of claim 14, further comprising:

a control unit connected to the circular heater, said control unit comprising:

means for controlling the temperature of the circular heater; and

means for moving the circular heater up or down at a desired speed.

16. The apparatus of claim 15, said control unit further comprising:

means for controlling the operation of said vacuum pump.

17. The apparatus of claim14, said circular heater being a furnace, and the apparatus further comprising:

an inert gas supply connected to the furnace for preventing oxidation of the furnace.

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18. A method for manufacturing an optical fiber preform, comprising the steps of:

preparing a deposited tube by depositing a clad layer and a core layer on the inside surface of a horizontally arranged preform tube;

sealing one end of the deposited tube;

arranging the deposited tube vertically with the sealed end up and arranging a circular heater

around the tube;

adjusting the temperature of the circular heater to a temperature lower than the softening point of the deposited tube;

moving the circular heater down and up over the length of the deposited tube while evacuating the deposited tube with a vacuum pump;

then, placing the circular heater above the sealed end of the deposited tube and adjusting the temperature of the circular heater to a temperature not lower than the softening point of the deposited tube and maintaining this temperature until the temperature is stabilized;

applying negative pressure to the interior of the deposited tube using the vacuum pump; and

shrinking the deposited tube by rotating the deposited tube while moving the circular heater downward over the deposited tube.

19. The method of claim 18, said step of preparing a deposited tube further comprising:

injecting a gas for forming a deposit into a first end of the preform tube and exhausting gas through a second end of the preform tube; and

said step of sealing one end comprising sealing said second end of the preform tube.

20. The method of claim 18, said step of shrinking the deposited tube further comprising rotating the tube at a rate of less than approximately 10 rpm.

21. The method of claim 18, further comprising the step of:

repeating said step of shrinking the deposited tube.

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22. The method of claim 18, further comprising the step of:

using a furnace as the circular heater.

23. The method of claim 22, further comprising the step of:

supplying an inert gas to said furnace for preventing oxidation of the furnace.

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24. The method of claim 18, said step of arranging the deposited tube further comprising:

attaching a rod to the sealed end of the deposited tube; and

mounting the deposited tube in a vertical lathe with the rod held by an upper support member of the vertical lathe.

25. The method of claim 18, said step of moving the circular heater further comprising:

injecting chlorine gas into the deposited tube.

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